

10/531659

JC13 Rec'd PCT/PTO 25 APR 2005

<110> InterCell AG

<120> Nucleic acids coding for adhesion factors of group B streptococcus, adhesion factors of group B streptococcus and further uses thereof

<130> I 10003 PCT

<160> 258

<170> PatentIn version 3.1

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<213> Streptococcus agalactiae

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 acttctaatc tttctgatgt tgagaaagct ttaggaaata ataaggTTAA taatggtgca 1620
 gtcaatgtat tgagagaaga tacagctcgt cttgagaata tgatttggaa tcgtgcttac 1680
 caagctattg aagaattcaa cgtcgtcgt aatacttata ataaccAAAT caagacagaa 1740
 acagttccag ttgataatga tattgaagct attttagcag gttctcaagc taaaatttagc 1800
 catttggaca atcgtatcgg agcgcgccac atggatcaag cttttgtagc tagtttatta 1860
 gaagttactg agatgagtaa atcaatctca tcgcgtataa aagagtag 1908

<210> 10

<211> 546

<212> DNA

<213> *Streptococcus agalactiae*

<400> 10

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 aaagcatttt atcaaagact acaagaaaaa caacgtaagg cacatactac tgtgaagact 180
 atctacaatt taggcattct tatttctcag gagtctaaag ggttcatcca acgtattgat 300
 aatgcctatt ctttggaaaa tgtctcagat attgttaatg aagctcaggc tttgtataaa 360
 cgtaactatg atttatttga aaaaatcaaa tctacacgtg ataaggTTCA agtcttactt 420

gcatcgcac aagataatac agacttaaaa aacttttatg ctgagttaga tgatatgtat 480
 gaacatgttt atctcaatga aagtagagtg gaggcgataa acagaaatat ccaaaaatat 540
 aattag 546

<210> 11
 <211> 442
 <212> PRT
 <213> Streptococcus agalactiae

<400> 11

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
 20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 50 55 60

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 85 90 95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 100 105 110

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 115 120 125

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 130 135 140

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 145 150 155 160

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 165 170 175

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 180 185 190

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 195 200 205

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 210 215 220

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 225 230 235 240

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 245 250 255

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 260 265 270

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 275 280 285

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 290 295 300

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 305 310 315 320

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 325 330 335

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Val Gly Gln Leu
 340 345 350

Ile Gly Lys Asn Pro Leu Leu Ser Lys Ser Ile Ile Ser Arg Glu Asn
 355 360 365

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 370 375 380

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
 385 390 395 400

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 405 410 415

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 420 425 430

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn
 435 440

<210> 12
 <211> 410
 <212> PRT
 <213> Streptococcus agalactiae

<400> 12

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Ser
 20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 50 55 60

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 85 90 95

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 100 105 110

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 115 120 125

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 130 135 140

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 145 150 155 160

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 180 185 190

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 195 200 205

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 210 215 220

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 225 230 235 240

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 245 250 255

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 260 265 270

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 275 280 285

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 290 295 300

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Val Gly Gln Leu
 305 310 315 320

Ile Gly Lys Asn Pro Leu Leu Ser Lys Ser Ile Ile Ser Arg Glu Asn
 325 330 335

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 340 345 350

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
 355 360 365

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 370 375 380

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 385 390 395 400

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn
 405 410

<210> 13

<211> 346

<212> PRT

<213> Streptococcus agalactiae

<400> 13

14

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
 20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 50 55 60

Glu Arg Arg Gln Arg Asp Val Glu Asn Arg Ser Gln Gly Asn Val Leu
 65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 85 90 95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 100 105 110

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 115 120 125

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 130 135 140

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 145 150 155 160

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 165 170 175

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 180 185 190

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 195 200 205

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 210 215 220

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 225 230 235 240

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Val Gly Gln Leu

15

245

250

255

Ile Gly Lys Asn Pro Leu Leu Ser Lys Ser Thr Ile Ser Arg Glu Asn
 260 265 270

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 275 280 285

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
 290 295 300

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 305 310 315 320

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 325 330 335

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn
 340 345

<210> 14

<211> 186

<212> PRT

<213> Streptococcus agalactiae

<400> 14

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
 20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 50 55 60

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Val Gly Gln Leu
 85 90 95

Ile Gly Lys Asn Pro Leu Leu Ser Lys Ser Ile Ile Ser Arg Glu Asn
 100 105 110

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 115 120 125

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
 130 135 140

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 145 150 155 160

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 165 170 175

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn
 180 185

<210> 15
 <211> 298
 <212> PRT
 <213> Streptococcus agalactiae

<400> 15

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
 20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 50 55 60

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 65 70 75 80

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 85 90 95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 100 105 110

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 115 120 125

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu

17

130 135 140
 Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
 145 150 155 160
 Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 165 170 175
 Glu Arg Arg Gln Arg Asp Ala Glu Asn Arg Ser Gln Gly Asn Val Leu
 180 185 190
 Glu Arg Arg Gln His Asp Val Glu Asn Lys Ser Gln Val Gly Gln Leu
 195 200 205
 Ile Gly Lys Asn Pro Leu Phe Ser Lys Ser Thr Val Ser Arg Glu Asn
 210 215 220
 Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 225 230 235 240
 Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
 Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 260 265 270
 Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 275 280 285
 Ser Leu Cys Gly Leu Arg Arg Asn Glu Asn
 290 295
 <210> 16
 <211> 618
 <212> PRT
 <213> Streptococcus agalactiae
 <400> 16
 Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
 1 5 10 15
 Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
 20 25 30
 Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
 35 40 45

18

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
50 55 60

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
65 70 75 80

Glu Arg Arg Gln Arg Asp Val Asp Asn Lys Ser Gln Gly Asn Val Leu
85 90 95

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
100 105 110

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu

Glu Arg Arg Gln Arg Asp Val Asp Asn Lys Ser Gln Gly Asn Val Leu
130 135 140

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
145 150 155 160

Glu Arg Arg Gln Arg Asp Val Asp Asn Lys Ser Gln Gly Asn Val Leu
165 170 175

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
180 185 190

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
195 200 205

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
210 215 220

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
225 230 235 240

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
245 250 255

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
260 265 270

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
275 280 285

Glu Arg Arg Gln Arg Asp Val Asp Asn Lys Ser Gln Gly Asn Val Leu
290 295 300

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 305 310 315 320

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 325 330 335

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 340 345 350

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 355 360 365

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 370 375 380

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 385 390 395 400

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 405 410 415

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 420 425 430

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 435 440 445

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 450 455 460

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 465 470 475 480

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 485 490 495

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Gly Asn Val Leu
 500 505 510

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Val Gly Gln Leu
 515 520 525

Ile Gly Lys Asn Pro Leu Phe Ser Lys Ser Thr Val Ser Arg Glu Asn
 530 535 540

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
 545 550 555 560

Ile Ser Gln Val Thr Asn Val Ala Asn Gly Pro Met Leu Thr Asn Asn
 565 570 575

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Asp Asp
 580 585 590

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
 595 600 605

Ser Leu Cys Gly Leu Arg Arg Asn Glu Asn
 610 615

<210> 17
 <211> 901
 <212> PRT
 <213> Streptococcus agalactiae

<400> 17

Met Arg Lys Tyr Gln Lys Phe Ser Lys Ile Leu Thr Leu Ser Leu Phe
 1 5 10 15

Cys Leu Ser Gln Ile Pro Leu Asn Thr Asn Val Leu Gly Glu Ser Thr
 20 25 30

Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45

Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60

Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80

Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95

Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110

Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125

Asn Ser Thr Ile Gly Gln Asn His Glu Glu Leu Asp Lys Gln Tyr Pro

130

135

140

Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160

Val Lys Gly Ser Val Pro Asn Gly Lys Ser Glu Ala Lys Ala Val Asn
 165 170 175

Pro Tyr Ser Ser Glu Gly Glu His Ile Arg Glu Ile Pro Glu Gly Thr

Leu Ser Lys Arg Ile Ser Glu Val Gly Asp Leu Ala His Asn Lys Tyr
 195 200 205

Lys Ile Glu Leu Thr Val Ser Gly Lys Thr Ile Val Lys Pro Val Asp
 210 215 220

Lys Gln Lys Pro Leu Asp Val Val Phe Val Leu Asp Asn Ser Asn Ser
 225 230 235 240

Met Asn Asn Asp Gly Pro Asn Phe Gln Arg His Asn Lys Ala Lys Lys
 245 250 255

Ala Ala Glu Ala Leu Gly Thr Ala Val Lys Asp Ile Leu Gly Ala Asn
 260 265 270

Ser Asp Asn Arg Val Ala Leu Val Thr Tyr Gly Ser Asp Ile Phe Asp
 275 280 285

Gly Arg Ser Val Asp Val Val Lys Gly Phe Lys Glu Asp Asp Lys Tyr
 290 295 300

Tyr Gly Leu Gln Thr Lys Phe Thr Ile Gln Thr Glu Asn Tyr Ser His
 305 310 315 320

Lys Gln Leu Thr Asn Asn Ala Glu Glu Ile Ile Lys Arg Ile Pro Thr
 325 330 335

Glu Ala Pro Arg Ala Lys Trp Gly Ser Thr Thr Asn Gly Leu Thr Pro
 340 345 350

Glu Gln Gln Lys Gln Tyr Tyr Leu Ser Lys Val Gly Glu Thr Phe Thr
 355 360 365

Met Lys Ala Phe Met Glu Ala Asp Asp Ile Leu Ser Gln Val Asp Arg
 370 375 380

Asn Ser Gln Lys Ile Ile Val His Ile Thr Asp Gly Val Pro Thr Arg
385 390 395 400

Ser Tyr Ala Ile Asn Asn Phe Lys Leu Gly Ala Ser Tyr Glu Ser Gln
405 410 415

Phe Glu Gln Met Lys Lys Asn Gly Tyr Leu Asn Lys Ser Asn Phe Leu
420 425 430

Leu Thr Asp Lys Pro Glu Asp Ile Lys Gly Asn Gly Glu Ser Tyr Phe
435 440 445

Leu Phe Pro Leu Asp Ser Tyr Gln Thr Gln Ile Ile Ser Gly Asn Leu
450 455 460

Gln Lys Leu His Tyr Leu Asp Leu Asn Leu Asn Tyr Pro Lys Gly Thr
465 470 475 480

Ile Tyr Arg Asn Gly Pro Val Arg Glu His Gly Thr Pro Thr Lys Leu
485 490 495

Tyr Ile Asn Ser Leu Lys Gln Lys Asn Tyr Asp Ile Phe Asn Phe Gly
500 505 510

Ile Asp Ile Ser Ala Phe Arg Gln Val Tyr Asn Glu Asp Tyr Lys Lys
515 520 525

Asn Gln Asp Gly Thr Phe Gln Lys Leu Lys Glu Glu Ala Phe Glu Leu
530 535 540

Ser Asp Gly Glu Ile Thr Glu Leu Met Lys Ser Phe Ser Ser Lys Pro
545 550 555 560

Glu Tyr Tyr Thr Pro Ile Val Thr Ser Ser Asp Ala Ser Asn Asn Glu
565 570 575

Ile Leu Ser Lys Ile Gln Gln Gln Phe Glu Lys Val Leu Thr Lys Glu
580 585 590

Asn Ser Ile Val Asn Gly Thr Ile Glu Asp Pro Met Gly Asp Lys Ile
595 600 605

Asn Leu Gln Leu Gly Asn Gly Gln Thr Leu Gln Pro Ser Asp Tyr Thr
610 615 620

23

Leu Gln Gly Asn Asp Gly Ser Ile Met Lys Asp Ser Ile Ala Thr Gly
 625 630 635 640

Gly Pro Asn Asn Asp Gly Gly Ile Leu Lys Gly Val Lys Leu Glu Tyr
 645 650 655

Ile Lys Asn Lys Leu Tyr Val Arg Gly Leu Asn Leu Gly Glu Gly Gln
 660 665 670

Lys Val Thr Leu Thr Tyr Asp Val Lys Leu Asp Asp Ser Phe Ile Ser
 675 680 685

Asn Lys Phe Tyr Asp Thr Asn Gly Arg Thr Thr Leu Asn Pro Lys Ser

Glu Asp Pro Asn Thr Leu Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp
 705 710 715 720

Val Arg Glu Tyr Pro Thr Ile Thr Ile Lys Asn Glu Lys Lys Leu Gly
 725 730 735

Glu Ile Glu Phe Thr Lys Val Asp Lys Asp Asn Asn Lys Leu Leu Leu
 740 745 750

Lys Gly Ala Thr Phe Glu Leu Gln Glu Phe Asn Glu Asp Tyr Lys Leu
 755 760 765

Tyr Leu Pro Ile Lys Asn Asn Asn Ser Lys Val Val Thr Gly Glu Asn
 770 775 780

Gly Lys Ile Ser Tyr Lys Asp Leu Lys Asp Gly Lys Tyr Gln Leu Ile
 785 790 795 800

Glu Ala Val Ser Pro Lys Asp Tyr Gln Lys Ile Thr Asn Lys Pro Ile
 805 810 815

Leu Thr Phe Glu Val Val Lys Gly Ser Ile Gln Asn Ile Ile Ala Val
 820 825 830

Asn Lys Gln Ile Ser Glu Tyr His Glu Glu Gly Asp Lys His Leu Ile
 835 840 845

Thr Asn Thr His Ile Pro Pro Lys Gly Ile Ile Pro Met Thr Gly Gly
 850 855 860

Lys Gly Ile Leu Ser Phe Ile Leu Ile Gly Gly Ser Met Met Ser Ile
 865 870 875 880

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<210> 18
<211> 674
<212> PRT
<213> Streptococcus agalactiae
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Met Lys Lys Ile Asn Lys Cys Leu Thr Val Phe Ser Thr Leu Leu Leu
1 5 10 15

Ile Leu Thr Ser Leu Phe Ser Val Ala Pro Ala Phe Ala Asp Asp Val
20 25 30

Thr Thr Asp Thr Val Thr Leu His Lys Ile Val Met Pro Gln Ala Ala
35 40 45

Phe Asp Asn Phe Thr Glu Gly Thr Lys Gly Lys Asn Asp Ser Asp Tyr
50 55 60

Val Gly Lys Gln Ile Asn Asp Leu Lys Ser Tyr Phe Gly Ser Thr Asp
65 70 75 80

Ala Lys Glu Ile Lys Gly Ala Phe Phe Val Phe Lys Asn Glu Thr Gly
85 90 95

Thr Lys Phe Ile Thr Glu Asn Gly Lys Glu Val Asp Thr Leu Glu Ala
100 105 110

Lys Asp Ala Glu Gly Gly Ala Val Leu Ser Gly Leu Thr Lys Asp Thr
115 120 125

Gly Phe Ala Phe Asn Thr Ala Lys Leu Lys Gly Thr Tyr Gln Ile Val
130 135 140

Glu Leu Lys Glu Lys Ser Asn Tyr Asp Asn Asn Gly Ser Ile Leu Ala
145 150 155 160

Asp Ser Lys Ala Val Pro Val Lys Ile Thr Leu Pro Leu Val Asn Asn
165 170 175

25

Gln Gly Val Val Lys Asp Ala His Ile Tyr Pro Lys Asn Thr Glu Thr
 180 185 190

Lys Pro Gln Val Asp Lys Asn Phe Ala Asp Lys Asp Leu Asp Tyr Thr
 195 200 205

Asp Asn Arg Lys Asp Lys Gly Val Val Ser Ala Thr Val Gly Asp Lys
 210 215 220

Lys Glu Tyr Ile Val Gly Thr Lys Ile Leu Lys Gly Ser Asp Tyr Lys
 225 230 235 240

Lys Leu Val Trp Thr Asp Ser Met Thr Lys Gly Leu Thr Phe Asn Asn
 245 250 255

Asn Val Lys Val Thr Leu Asp Gly Lys Asp Phe Pro Val Leu Asn Tyr
 260 265 270

Lys Leu Val Thr Asp Asp Gln Gly Phe Arg Leu Ala Leu Asn Ala Thr
 275 280 285

Gly Leu Ala Ala Val Ala Ala Ala Ala Lys Asp Lys Asp Val Glu Ile

Lys Ile Thr Tyr Ser Ala Thr Val Asn Gly Ser Thr Thr Val Glu Val
 305 310 315 320

Pro Glu Thr Asn Asp Val Lys Leu Asp Tyr Gly Asn Asn Pro Thr Glu
 325 330 335

Glu Ser Glu Pro Gln Glu Gly Thr Pro Ala Asn Gln Glu Ile Lys Val
 340 345 350

Ile Lys Asp Trp Ala Val Asp Gly Thr Ile Thr Asp Val Asn Val Ala
 355 360 365

Val Lys Ala Ile Phe Thr Leu Gln Glu Lys Gln Thr Asp Gly Thr Trp
 370 375 380

Val Asn Val Ala Ser His Glu Ala Thr Lys Pro Ser Arg Phe Glu His
 385 390 395 400

Thr Phe Thr Gly Leu Asp Asn Thr Lys Thr Tyr Arg Val Val Glu Arg
 405 410 415

Val Ser Gly Tyr Thr Pro Glu Tyr Val Ser Phe Lys Asn Gly Val Val
 420 425 430

Thr Ile Lys Asn Asn Lys Asn Ser Asn Asp Pro Thr Pro Ile Asn Pro
 435 440 445

Ser Glu Pro Lys Val Val Thr Tyr Gly Arg Lys Phe Val Lys Thr Asn
 450 455 460

Gln Ala Asn Thr Glu Arg Leu Ala Gly Ala Thr Phe Leu Val Lys Lys
 465 470 475 480

Glu Gly Lys Tyr Leu Ala Arg Lys Ala Gly Ala Ala Thr Ala Glu Ala
 485 490 495

Lys Ala Ala Val Lys Thr Ala Lys Leu Ala Leu Asp Glu Ala Val Lys
 500 505 510

Ala Tyr Asn Asp Leu Thr Lys Glu Lys Gln Glu Gly Gln Glu Gly Lys
 515 520 525

Thr Ala Leu Ala Thr Val Asp Gln Lys Gln Lys Ala Tyr Asn Asp Ala
 530 535 540

Phe Val Lys Ala Asn Tyr Ser Tyr Glu Trp Val Ala Asp Lys Lys Ala
 545 550 555 560

Asp Asn Val Val Lys Leu Ile Ser Asn Ala Gly Gly Gln Phe Glu Ile
 565 570 575

Thr Gly Leu Asp Lys Gly Thr Tyr Ser Leu Glu Glu Thr Gln Ala Pro
 580 585 590

Ala Gly Tyr Ala Thr Leu Ser Gly Asp Val Asn Phe Glu Val Thr Ala
 595 600 605

Thr Ser Tyr Ser Lys Gly Ala Thr Thr Asp Ile Ala Tyr Asp Lys Gly
 610 615 620

Ser Val Lys Lys Asp Ala Gln Gln Val Gln Asn Lys Lys Val Thr Ile
 625 630 635 640

Pro Gln Thr Gly Gly Ile Gly Thr Ile Leu Phe Thr Ile Ile Gly Leu
 645 650 655

Ser Ile Met Leu Gly Ala Val Val Val Met Lys Lys Arg Gln Ser Glu
 660 665 670

Glu Ala

<210> 19
 <211> 635
 <212> PRT
 <213> Streptococcus agalactiae

<400> 19

Met Lys Lys Gln Phe Leu Lys Ser Ala Ala Ile Leu Ser Leu Ala Val
 1 5 10 15

Thr Ala Val Ser Thr Ser Gln Pro Val Ala Gly Ile Thr Lys Asp Tyr
 20 25 30

Asn Asn Arg Asn Glu Lys Val Lys Lys Tyr Leu Gln Glu Asn Asn Phe
 35 40 45

Gly His Lys Ile Ala Tyr Gly Trp Lys Asn Lys Val Glu Phe Asp Phe
 50 55 60

Arg Tyr Leu Leu Asp Thr Ala Lys Tyr Leu Val Asn Lys Glu Glu Phe
 65 70 75 80

Gln Asp Pro Leu Tyr Asn Asp Ala Arg Glu Glu Leu Ile Ser Phe Ile
 85 90 95

Phe Pro Tyr Glu Lys Phe Leu Ile Asn Asn Arg Asp Ile Thr Lys Leu
 100 105 110

Thr Val Asn Gln Tyr Glu Ala Ile Val Asn Arg Met Ser Val Ala Leu
 115 120 125

Gln Lys Phe Ser Lys Asn Ile Phe Glu Lys Gln Lys Val Asn Lys Asp
 130 135 140

Leu Ile Pro Ile Ala Phe Trp Ile Glu Lys Ser Tyr Arg Thr Val Gly
 145 150 155 160

Thr Asn Glu Ile Ala Ala Ser Val Gly Ile Gln Gly Gly Phe Tyr Gln
 165 170 175

Asn Phe His Asp Tyr Tyr Asn Tyr Ser Tyr Leu Leu Asn Ser Leu Trp
 180 185 190

His Glu Gly Asn Val Lys Glu Val Val Lys Asp Tyr Glu Asn Thr Ile

195	200	205
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Ser Thr Ser Asp Ile Ser Ile Asp Asp Asp Asp Tyr Glu Lys Gly Asn 225 230 235 240		
Lys Glu Leu Leu Arg Glu Lys Leu Asn Ile Ile Leu Asn Leu Ser Lys 245 250 255		
Arg Asp Tyr Arg Val Thr Pro Tyr Tyr Glu Val Asn Lys Leu His Thr 260 265 270		
Gly Leu Ile Leu Leu Glu Asp Val Pro Asn Leu Lys Ile Ala Lys Asp 275 280 285		
Lys Leu Phe Ser Leu Glu Asn Ser Leu Lys Glu Tyr Lys Gly Glu Lys 290 295 300		
Val Asn Tyr Glu Glu Leu Arg Phe Asn Thr Glu Pro Leu Thr Ser Tyr 305 310 315 320		
Leu Glu Asn Lys Glu Lys Phe Leu Val Pro Asn Ile Pro Tyr Lys Asn 325 330 335		
Lys Leu Ile Leu Arg Glu Glu Asp Lys Tyr Ser Phe Glu Asp Asp Glu 340 345 350		
Glu Glu Phe Gly Asn Glu Leu Leu Ser Tyr Asn Lys Leu Lys Asn Glu 355 360 365		
Val Leu Pro Val Asn Ile Thr Thr Ser Thr Ile Leu Lys Pro Phe Glu 370 375 380		
Gln Lys Lys Ile Val Glu Asp Phe Asn Pro Tyr Ser Asn Leu Asp Asn 385 390 395 400		
Leu Glu Ile Lys Lys Ile Arg Leu Asn Gly Ser Gln Lys Gln Lys Val 405 410 415		
Glu Gln Glu Lys Thr Lys Ser Pro Thr Pro Gln Lys Glu Thr Val Lys		
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Lys Ser Glu Thr Val Ala Thr Ser Gln Gln Ser Ser Val Ala Gln Thr
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Ser Val Gln Gln Pro Ala Pro Val Gln Ser Val Val Gln Glu Ser Lys
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Ala Ser Gln Glu Glu Ile Asn Ala Ala His Asp Ala Ile Ser Ala Tyr
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Lys Ser Thr Val Asn Ile Ala Asn Thr Ala Gly Val Thr Thr Ala Glu
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Met Thr Thr Leu Ile Asn Thr Gln Thr Ser Asn Leu Ser Asp Val Glu
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Lys Ala Leu Gly Asn Asn Lys Val Asn Asn Gly Ala Val Asn Val Leu
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Arg Glu Asp Thr Ala Arg Leu Glu Asn Met Ile Trp Asn Arg Ala Tyr
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Gln Ala Ile Glu Glu Phe Asn Val Ala Arg Asn Thr Tyr Asn Asn Gln
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Ile Lys Thr Glu Thr Val Pro Val Asp Asn Asp Ile Glu Ala Ile Leu
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Ala Gly Ser Gln Ala Lys Ile Ser His Leu Asp Asn Arg Ile Gly Ala
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Tyr Val Lys Met Ser Glu Lys Ser Lys Ala Phe Tyr Gln Arg Leu Gln
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Glu Lys Gln Arg Lys Ala His Thr Thr Val Lys Thr Phe Asn Asn Ser
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Glu Ile Arg His Gln Leu Pro Leu Lys Gln Glu Lys Ala Arg Asn Asp
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Ile Tyr Asn Leu Gly Ile Leu Ile Ser Gln Glu Ser Lys Gly Phe Ile
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Gln Arg Ile Asp Asn Ala Tyr Ser Leu Glu Asn Val Ser Asp Ile Val
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Asn Glu Ala Gln Ala Leu Tyr Lys Arg Asn Tyr Asp Leu Phe Glu Lys
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Ile Lys Ser Thr Arg Asp Lys Val Gln Val Leu Leu Ala Ser His Gln
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Asp Asn Thr Asp Leu Lys Asn Phe Tyr Ala Glu Leu Asp Asp Met Tyr
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